REMARKS/ARGUMENTS

Favorable consideration of this Application and in light of the following discussion is respectfully requested.

Claims 1, 3-6 and 8-15 are pending in the present application. Claims 2 and 7 have been cancelled without prejudice or disclaimer. Claims 1, 3, 6 and 8-10 are amended. New Claims 11-15 have been added, all without the introduction of any new matter. Support for the changes to claims 1 and 6 appear at least in canceled claim 2 and 7. The modification to Claims 5 and 8 is supported at least at page 10, lines 15-16, of the specification, for example; support for the temperature measurement hole of Claim 6, 9, and 10 as well as new Claim 11 appear at page 10, line 25 to page 11, line 7, of the specification, for example; support for new Claim 14 appears at page 11, lines 13-16, for example; support for new Claim 12 appears at page 10, lines 6-9, for example; support for Claim 13 and part of the change to new Claim 11 appear at page 12, lines 7-13, for example; and support for new Claim 15 appear at page 11, lines 4-7, for example.

In the outstanding Office Action, Claims 1-4 and 6-9 are rejected under 35 U.S.C. §103(a) as unpatentable over Applicants admitted prior art (herein AAPA) in view of Sugihara et al. (JP 03072624, herein "Sugihara") and Craig A. Phelps (U.S. Pat. No. 5,724,234, herein "Phelps"); and Claims 5 and 10 are rejected under 35 U.S.C. §103(a) as unpatentable over AAPA, Sugihara, and Phelps in further view of Shimamura et al. (U.S. Pat. No. 5,707,500, herein "Shimamura") as evidenced by Soloman (Article in Publication, Sensors handbook by Sabrie Soloman, Copyright 1999).

As mentioned above, applicant has amended independent Claims 1 and 6 to incorporate the subject matter of dependent Claims 2 and 7, respectively. Specifically, Claims 1 and 6 have been amended to recite a diameter of an opening provided in a conductive

vessel is clearly specified to 1/50 or less of the wavelength of the radio frequency power. Additionally, Claims 2 and 7 have been cancelled.

Turning now to the rejection in the outstanding Office Action of Claims 1-4 and 6-9 under 103(a) based on AAPA, Sugihara, and Phelps, Applicants respectfully traverse that rejection for at least the following reasons.

Claim 6 recites, in part,

> a conductive vessel being set to a ground potential and having a space formed therein in which a plasma is generated by application of a radio frequency power;
> a susceptor which is disposed in said conductive vessel and on which a substrate to be processed is to be placed; and
> a radiation thermometer for measuring a temperature of the susceptor,
> wherein the susceptor has a temperature measurement hole disposed at a predetermined portion for measuring a temperature of the susceptor on a rear surface side of said susceptor,
> wherein said conductive vessel has an opening that is formed in a portion facing the predetermined temperature measured portion a diameter of 1/50 or less of a wavelength of the radio frequency power to suppress a leakage, and
> wherein said radiation thermometer is directly installed at an external part of the opening to detect an infrared ray emitted from the temperature measured portion to measure a temperature of said susceptor.

Claim 1 recites similar features, particularly as to the conductive vessel which has an opening "facing the predetermined temperature measured portion on a rear face of a susceptor, the opening having a diameter 1/50 or less of a wavelength of the radio frequency power."

Sugihara discloses a temperature measuring system for measuring a temperature of a monitoring sample piece 12 with measurement holes 19 formed in its rear and provided on the end part of a sample stand 23. The system[1] 1 is constituted of the monitoring sample piece 12 installed on a through hole 11 formed in the end part of the cathode 23, a spacer member 14 arranged so as to form a measuring space 13 between the inner wall of a vacuum container

[1] Sugihara, Fig. 2.

21 and the sample stand, a peep window 15 formed at the position of this space 13 and the infrared temperature indicator 16 arranged outside of the container 21 so as to measure the temperature of the sample piece through this peep windows 15.[2]

The outstanding Office Action states on page 2, paragraph 2, line 10 that "Sugihara et al disclose temperature measurement of a sample in a grounded chamber (Fig 2 and Fig 4) for treatment of a semiconductor substrate by an infrared thermometer 16 looking through an opening 15 in the chamber wall at the rear of the sample through a recess 19, therefore it would have been obvious for one of ordinary skill in the art at the time of invention to use infrared thermometer for its accurate and reliable measurement of temperature."

However, Sugihara does not disclose or suggest measuring a temperature of the susceptor, as is recited in Claim 6. In contrast, as noted in the outstanding Office Action above, in Sugihara the temperature of a monitoring sample piece is measured. In the present invention, the temperature control during the plasma treatment is carried out by heating or cooling the susceptor itself. Hence, it is important to directly know the temperature of the susceptor, as a temperature control means. Additionally, the temperature measuring system of the present invention can be applied in any plasma processing process, regardless of the kind of sample to be processed.

Further, Sugihara does not disclose or suggest an opening that is formed in a portion facing the predetermined temperature measured portion of a susceptor, the opening having a diameter of 1/50 or less of a wavelength of the radio frequency power to suppress a leakage. In contrast, the infrared temperature indicator 16 of Sugihara is arranged outside of the container 21 so as to measure the temperature of the sample piece through this peep window

[2] Sugihara, Col. 6, lines 9-18.

15.[3] Thus, Sugihara is silent as to the leakage of the radio frequency power to the outside of the chamber.

Therefore, even if AARA is combined with Sugihara, this combination would not result in the temperature measurement method recited in Claim 1 or the plasma processing apparatus recited in Claim 6.

Accordingly, Applicant respectfully submits that independent Claims 6 and similarly Claim 1 patentably distinguish over AAPA and Sugihara considered alone or together in any proper combination.

Phelps discloses a radio frequency shielding of electronic components or circuitry mounted on circuit boards and more specifically the use of stamped or formed metal shielding devices, known as shield cans. Further, Phelps discloses the shield cans have a plurality of circular openings or slots for air plow at the surface. In Cols 1 and 2, Phelps discloses that gap size should be no more than 1/20 of the wavelength of the frequency.

Thus, Phelps does not cure the deficiencies of AAPA and Sugihara noted above with respect to independent Claims 1 and 6. Further, with respect to the opening recited in the independent claims, Phelps does not disclose an opening formed to suppress a leakage. Accordingly, the gap size disclosed in Phelps is not the same as the opening recited in the independent claims.

Accordingly, Applicant respectfully submits that independent Claims 1 and 6 and claims depending therefrom patentably distinguish over AAPA, Sugihara, and Phelps considered alone or together in any proper combination.

Moreover, with respect to the further cited teachings to Shimamura and Soloman, neither of these further cited teachings are believed to overcome the above-noted deficiencies of AAPA, Sugihara, and Phelps.

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[3] Sugihara, Col 6, Lines 9-18

Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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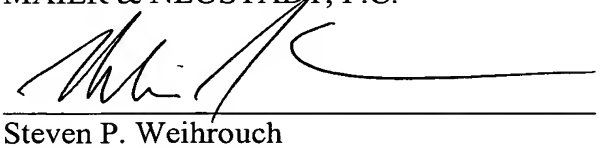

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